

# An expanding syphilis epidemic in China: epidemiology, behavioural risk and control strategies with a focus on low-tier female sex workers and men who have sex with men

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## INTRODUCTION

Syphilis has made a dramatic resurgence in China during the past two decades. During the Cultural Revolution (1966–76), sexually transmitted infections (STI) were so uncommon that they were removed from standard Chinese medical training curricula.<sup>1</sup> As China's market economy expanded during 1980s economic reforms, reported STI, including syphilis infection, quickly re-appeared. An evolving STI reporting infrastructure largely assembled in the 1990s has noted increasing syphilis cases, particularly during the past 5 years (figure 1).<sup>2–3</sup> Now syphilis is among the top five reported communicable diseases in many major province-level municipalities and provinces.<sup>4</sup> While China's syphilis case reporting system and potential determinants of spread have been outlined in other reviews,<sup>2</sup> there have been many studies on syphilis infection among female sex workers (FSW).<sup>5–6</sup> This review analyses syphilis in China from the perspective of two critical high-risk populations: men who have sex with men (MSM) and low-tier FSW. Here we define low-tier FSW as women who usually solicit clients on the street or public outdoor places and sell sex for less than approximately €2–10 per client. Although preventing adverse outcomes associated with syphilis in pregnancy is important,<sup>7</sup> this review focuses on adult syphilis infections in China. The purpose of this review is to examine syphilis epidemiology, risk behaviours, control strategies and research priorities in the Chinese context.

## EPIDEMIOLOGY AND RISK BEHAVIOURS

Syphilis has emerged as a major public health problem among MSM in China. A meta-analysis of HIV and syphilis prevalence among MSM in China found increasing prevalence of both infections, with a summary syphilis prevalence of 9.1%.<sup>8</sup> Several cohort studies have demonstrated a high incidence of HIV, syphilis and HIV/syphilis co-infection among Chinese MSM (table 1).<sup>9–13</sup> Whereas MSM are believed to account for 2–4% of the Chinese adult male population,<sup>14</sup> they comprised an estimated 32.5% of all new HIV cases in 2009.<sup>15</sup> Although disease monitoring has improved in the past 10 years, routine surveillance of MSM remains incomplete, and only 8.6% were covered by health surveillance and outreach efforts by the end of 2008.<sup>16</sup>

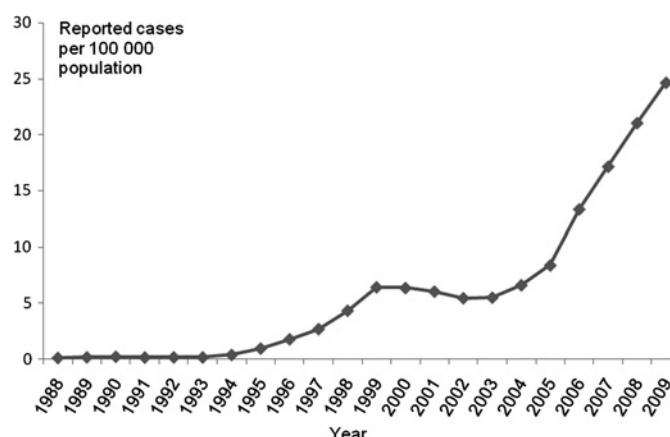
Although there are fewer epidemiological studies, low-tier FSW also have an increased risk of syphilis and other STI.<sup>17</sup> Extensive sociological and anthropological research from China suggests there are distinct typologies of female sex work, each with well-defined work locations, income and sexual risks.<sup>18</sup> Low-tier FSW either independently solicit clients in parks (street-walking FSW) or find clients through managers/pimps at beauty salons or construction sites.<sup>18</sup> A systematic review found that low-tier FSW are approximately twice as likely to have syphilis as FSW who charge more per client.<sup>19</sup> Some studies have found extremely high syphilis prevalence in this group, ranging from 10% to 38%.<sup>20–21</sup> However, low-tier FSW are less well represented in current surveillance and intervention programmes in China. Higher sexual risk among low-tier FSW may be related to greater numbers of clients per day,<sup>22</sup> less condom self-efficacy with clients that can pay extra for unsafe sex, or more frequently changing work locations.<sup>23–24</sup>

## SYPHILIS CONTROL STRATEGIES

Traditional syphilis control strategies focus on screening of high-risk groups, timely diagnosis and treatment, partner notification and treatment, and education/awareness campaigns.<sup>25</sup> Although there have been some small pilot behavioural intervention programmes for MSM<sup>26</sup> and low-tier FSW,<sup>22</sup> both of these groups are difficult to identify and longitudinally follow in the Chinese context. Several government programmes and the Global Fund initiative have supported local civil society organisations to promote condoms and sexual health, although the programmatic focus has been on HIV prevention to date. China's recently launched 10-year national syphilis control and prevention plan includes explicit targets for decreasing primary syphilis cases, establishing a strong foundation for further targeted syphilis control programmes.<sup>27</sup> Beyond case finding, ensuring that individuals and their sex partners receive appropriate treatment is also critical for syphilis control. The availability of rapid point-of-care tests in many public and private clinics in China helps promote routine screening and timely diagnosis.<sup>28</sup> In addition, developing syphilis partner notification systems that are acceptable to MSM, low-tier FSW and other high-risk groups are important for developing a comprehensive syphilis control response.



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**Figure 1** Reported total syphilis cases per 100 000 population in China.<sup>2 3</sup>

## RESEARCH PRIORITIES

Responding to the syphilis epidemics among MSM and low-tier FSW in China will require further research. Innovative strategies to access hard-to-reach populations and prevent STI/HIV should be developed as only a small part of these two populations are now covered by control programmes in China. Creating responsive clinical services and syphilis testing sites takes time and requires input not only from key public health leaders and clinicians, but also from civil society organisations and community groups that are largely incipient in China. In this context, MSM civil society organisations are more well organised than FSW groups in China, but both types of organisations require further training, more personnel and greater programmatic experience in order to help implement syphilis control programmes. Integration of syphilis testing into provider-initiated HIV testing and counselling may be a good opportunity not only to help detect syphilis infections but also to strengthen HIV case finding.<sup>29</sup> An ongoing project supported by the World Health Organization and the China–Australia Health and HIV/AIDS Facility focuses on integrating syphilis control into Chinese provider-initiated HIV testing and counselling practice. The high burden of syphilis among MSM and subsets of FSW creates unique opportunities for syphilis control research.

## CONCLUSIONS

China has a resurgent syphilis epidemic that is particularly prominent among MSM and low-tier FSW. Several domestic and international programmes focused on these high-risk groups in

**Table 1** Comparison of syphilis among MSM and low-tier FSW in China

Variable	MSM	Low-tier FSW*
Syphilis prevalence estimates	9.1% (95% CI 7.6% to 10.8%) <sup>8</sup>	12.5% (IQR 4.1–20.1) <sup>19</sup>
Syphilis incidence estimates	8–17 cases per 100 person years <sup>9–13</sup>	Unknown†
Population size	3.6–7.1 million <sup>30</sup> ‡	Unknown‡
Partner notification	Not routine	Not routine
Civil society organisations <sup>31</sup>	121	30

\*Defined as women who usually solicit clients on the street or public outdoor places and sell sex for less than €2–10 per client.

†Number of men who have sex with men (MSM) at high risk, which was estimated in 2005.<sup>30</sup>

‡Low-tier female sex workers (FSW) are difficult to reach by conventional public health outreach and estimating the population size and retaining them in cohorts is challenging.

China establish a strong foundation to implement syphilis-specific control programmes. With explicit benchmarks and process indicators, the national syphilis control plan holds great promise. As China has demonstrated with HIV control efforts, high-level government commitment can translate into a number of scalable, substantive and efficacious programmes.<sup>32</sup>

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**Competing interests** None.

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